

IMPERIAL CARBON BLACK PLANT (RUIN)
North side of the North Fork of Hughes River
along Bunnell Run Road just over 0.5 mile
from its intersection with State Route 16
Harrisville Vicinity
Ritchie County
West Virginia

HAER No. WV-69

HAER
WVA,
43-HARVLM,
2-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
Philadelphia Support Office
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

HISTORIC AMERICAN ENGINEERING RECORD

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Bunnell Run Road just over 0.5 mile from its intersection
with State Route 16. Harrisville vicinity,
Ritchie County, West Virginia

U.T.M.: 17.497500.4341265
Quad: Harrisville, West Virginia

Date of Construction: ca. 1910

Engineer: Unknown

Present Owner: Little Kanawha Soil Conservation District
Route 5 Box 1000
Parkersburg, West Virginia

Present Use: Abandoned

Significance: From 1900 to 1925 the state of West Virginia was a national leader
in the production of natural gas, natural gasoline, and carbon
black. These ruins are visible reminders of these three, related
industries. They are eligible for the National Register of Historic
Places. They represent industries once vital to the economy of
northwestern West Virginia and Ritchie County, and, in part, tell
the story of the nearly-forgotten community of Hannahdale.

Project Information: This investigation is part of a larger mitigation study undertaken
at the request of the National Resources Conservation Service in
connection with their proposed reservoir project.

Past & Present, Consultants
The Kemp Group, Inc.
429 Riley Street
Morgantown, WV 26505
January 2000

Summary Description of Site

Ruins lie on the flood plain of the North Fork of the Hughes River next to Bunnell Run Road, occupying an egg-shaped site which measures approximately 325' x 135' (96m x 40m). The site consists of an industrial component and a much smaller residential component. There are fifty-four distinct features, including concrete machinery mounts, concrete tanks, foundation pads, concrete cooling tanks, concrete footers, concrete foundation piers, metal tanks, well pipes, water wells, collapsed wooden sheds, well piping, a grade for the Pennsboro and Harrisville (Lorama) Railway, and the water well and cellar remains of a residence. The industrial component of the site has been characterized in both Phase I and Phase II investigations as foundations and emplacements for a lamp black plant and a gas compressor station with a byproduct drip gasoline operation. However, informant interviews, site interpretations, and archival photographs and documents indicate that gas compression, with byproduct drip gasoline production, was the primary function of the site, and a carbon black plant was located approximately 200' upstream. Nonetheless, there is evidence to suggest that a few features at the site were related to the carbon black plant as storage or other ancillary buildings.

History of Natural Gas Industry in West Virginia

Natural gas is a mixture of hydrocarbons of the paraffine series composed of differing quantities of methane, ethane, propane, butane, pentane, and hexane and small portions of nitrogen, carbon dioxide, water vapor, and sometimes sulfur. Often found in conjunction with oil, natural gas is known to exist in twenty-four states, including West Virginia. This state is part of the Appalachian Basin, a great coal- and petroleum-bearing trough extending from Newfoundland to Alabama. Only seven of West Virginia's fifty-five counties are barren of oil and gas, but its great productive fields lie in the western half of the state. While the productive areas, or fields, in this section are poorly defined, at least twenty major fields have been named in northern West Virginia and several others in the southern part of the state.

The history of natural gas production and utilization in West Virginia begins in the Great Kanawha Valley during the first half of the nineteenth century, where salt manufacturers encountered natural gas while drilling salt wells. At first considered a nuisance, it was put to good use as fuel for evaporating brine by William Tompkins in 1841, and later by other manufacturers. This was the first use of natural gas in the United States for manufacturing purposes. The Kanawha salt drillers also developed many of the tools and techniques which were used later for drilling, casing, and pumping oil and gas.

The methods of drilling invented on the Great Kanawha spread to the Little Kanawha and Hughes river area of northwestern Virginia, where the Rathbone family drilled the state's first petroleum well in 1859, soon after E.L. Drake struck oil in Titusville, Pennsylvania. The success of the Rathbones led to an oil boom in the Burning Springs Run area. Residents of Oiltown, the center of this field, used natural gas to light their town in 1861, the first recorded

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residential use in what would soon become West Virginia. At the height of this development in May, 1863 a force of Confederate troops under the command of General W.E. Jones raided Burning Springs, set fire to the stocks of oil, and destroyed the drilling equipment. The burned and abandoned wells became water-logged, and the region never fully recovered from the devastation.

After the Civil War, drilling continued in the "oil belt" or Burning Springs anticline in Wood, Ritchie, Pleasants and Wirt counties, including the famous Volcano field in the 1870s, but little development occurred in other parts of the state. Production of oil and gas declined after 1876, in part because the Pennsylvania fields were fully meeting the nation's needs. Also, many state drillers were unable to reach the deeper-producing sands because of their inability to deal with the soft rock of the overlying strata, which crumbled and collapsed into the holes, causing their tools to lodge.

A resurgence in the state's industry took place in the late-1880s as overall demand increased and drillers begin to use better well casing. The development of the anticlinal theory of prospecting by Dr. I.C. White in this decade permitted drillers to use geology to find deposits. In quick succession during the late-1880s and early-1890s, the Eureka field in Pleasants County, Doll's Run field in Monongalia County, the Mannington field in Marion County, and the Sistersville field in Tyler County were opened, and drilling was renewed in Wood, Wirt, and Ritchie counties. These developments brought the state's industry to national prominence, and in 1900 West Virginia surpassed Pennsylvania as the nation's leading oil-producing state.

Until the 1890s, drillers did little to exploit the natural gas found in conjunction with oil. It was sometimes used to power drilling and pumping machinery and occasionally for lighting, but it was usually simply vented and wasted. When a well came in producing gas alone it was a common practice to allow it to blow in the air in the hope that it would eventually produce oil. No wells were drilled in the state solely to obtain natural gas until 1889. Drillers did not seek natural gas because they were unwilling and often unable to make the investments for pipelines to transport the gas to prospective customers. Moreover there was no little demand for natural gas for home use at this time because of hazards connected with its use.

This situation changed in the 1890s due to the demands of industrial users in Pennsylvania, who found their gas supplies dwindling and looked to northern West Virginia for new supplies, and to state municipalities, which began to use gas for heating and lighting. The development of the cast iron pipeline and gas compressor station in this decade made long-distant transmission of natural gas feasible. By 1893 Wheeling, Clarksburg, Fairmont, Grafton, Morgantown, and most towns in the northern panhandle were supplied with natural gas. By 1895 large-diameter pipelines to Pennsylvania, built by the Philadelphia Company and Carnegie Gas Company, were transmitting West Virginia gas in large volumes to industrial users. And, by the first decade of the twentieth century, glass factories and other industries within the state had become large consumers of natural gas.

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The rapidly expanding markets for natural gas, especially beyond the borders of the state, and the increasing competition among the numerous small companies, led to a consolidation movement of gas companies in the 1895 to 1910 period. This movement got under way with the founding of the Pittsburgh and West Virginia Gas Company in 1894 and the Hope Natural Gas Company in 1898. Through the enlarged facilities of these consolidated companies there was a rapid expansion of the natural gas business. By 1908 West Virginia surpassed Pennsylvania as the nation's leading producer of natural gas; it retained first place until 1924.

Situated along the Burning Springs anticline, western Ritchie County was the scene of some of the earliest oil and gas development in the state. Wells near Petroleum on the Baltimore and Ohio Railroad, California House, and Cairo were brought in during the 1860s and early-1870s. These early wells were drilled in shallow sands, however, as drillers were unable to go deeper. A great resurgence of drilling, both in the older fields of the county and in virgin territory east of Harrisville, began around 1890 after drillers solved technological problems and hit the deeper Squaw and Big Injun sands.

This deeper drilling made development possible in the Lost Run-Gooseneck field. Situated along the North Fork of the Hughes River about three miles northeast of Harrisville near the Gooseneck--a sharp bend of the stream--in Clay and Union Districts, this field underwent rapid development after oil was discovered there in 1897 in the Big Injun Sand at about 1,680 feet. This field was developed at first for petroleum, but when flows slackened, it was exploited mainly for natural gas.

Founding of Imperial Oil and Gas Products Company

The Imperial Oil and Gas Products Company was one of several companies operating in the Lost Run-Gooseneck field. It was incorporated on June 3, 1908, and scheduled to expire on May 1, 1958. The certificate of incorporation indicated that the principal place of business would be Harrisville and Ritchie County. Capitalized at \$60,000, the company had the stated objective of "...manufacturing, producing, selling, and dealing in carbon black of all grades; owning and acquiring lands for the development of the same in the production of natural gas, oil, ores, metals and minerals and the products and byproducts; to own, lease and acquire lands and operate and dispose of oil refineries, saw mills; to do a general manufacturing and mercantile business..." The six shareholders included two local men, J.L. Mann of West Union and P.H. Campbell of Harrisville, and three from Pennsylvania: Joseph Hartman, Jr., William Little, and Joseph Merkt.

The Carbon Black Industry

One of Imperial's primary objectives was to manufacture carbon black, a black pigment used in the manufacture of printer's ink, rubber, black and gray paint and enamel, and other products such as phonograph records, carbon paper, crayons, and typewriter ribbons. Carbon black is a

hydrocarbon--the soot of natural gas--produced through the incomplete combustion of a natural gas flame against a metal surface. It is a velvety black pigment that is distinct from lamp black, which is made by burning oil or other carbonaceous material with insufficient air and collecting the smoke in settling chambers. Lamp black is gray in contrast to the deep black of carbon black, and is considered inferior to carbon black in making inks and useless in the production of rubber.

A form of carbon black was first made in the United States from manufactured gas by a Philadelphia ink maker, J.K. Wright, in 1864 to produce a glossy printing ink. The first factory in which carbon black was made on a commercial scale from natural gas was established in 1872 in New Cumberland (Hancock County), West Virginia. It was operated by the firm Howarth and Lamb, and operated under a patent held by John Howarth. At this plant, natural gas jets were arranged below slabs of soapstones, or "benches," which acted as the condensing surface. Mechanical scrapers positioned below the slabs traveled along horizontal grooves and removed the deposited carbon black, which fell into sheet-iron aprons. The plant was built of wood, and was destroyed by fire after running only a short time, and the business was moved to Saxonburg, Pennsylvania in 1874. Shortly thereafter a carbon black factory was built at Gambier, Ohio by Peter Neff, and in 1879 A. V. Nolen built another factory at New Cumberland.

Until the 1930s, the three principal methods of making carbon black were the 1) large plate process, 2) small rotating disk process, and 4) channel process. All three were developed during the second decade of the carbon black industry, 1882 to 1892, and named for the type of condensing surface used. In 1883 L. Martin & Company developed the large plate process at a small plant at Fosters Mills, Pennsylvania. Five 24' diameter, cast-iron plates, supported by a central mast, rotated above stationary burners. In the same year, A.R. Blood devised a method of making carbon black at Warren, Pennsylvania using small, revolving, cast-iron plates about 3' diameter as condensing surfaces. Unlike the larger plates, the smaller ones could be made in one casting, and did not require ventilation holes. This system included a scraper positioned below the plates, which scraped the black into a conveyor running beneath the plates. The channel process was invented by L.J. McNutt, who obtained a patent in 1892 for a process put into place at a factory at Gallagher, Pennsylvania. A system of channel beams, turned with the flat side downward, were positioned over a horizontal row of stationary burners. The channels had a reciprocating motion, being slowly drawn back and forth. The black was scraped from the channel bottom and removed by a spiral conveyor. By using channel irons a smoother depositing surface was possible than by using un-surfaced cast-iron plates. With some variations and improvements, these three processes dominated the industry until the 1930s, when the furnace method, in which natural gas is preheated then burned with insufficient air under pressure in a tower containing refractory material, became widespread.

Carbon black has been a migratory industry because profitable manufacture depends on plentiful, cheap supplies of natural gas, typically available only during the opening of a field. After the early West Virginia plants, Pennsylvania became the center of the industry during the

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late-nineteenth century, but after pipelines were built there in the 1890s to supply industrial and residential users, the price of gas increased. As a result the industry moved back to its birthplace in West Virginia. In 1899 Godfrey L. Cabot of Boston, Massachusetts began construction of an extensive carbon black factory at Grantsville using the large-plate process. Covering six acres and with 113 plates, this factory became the largest producer of carbon black in the world by 1902. The black was carried to markets down the Little Kanawha River in gasoline boats.

The first decade of the 1900s witnessed an expansion of the carbon black industry in West Virginia so that by 1912 the state had become the leading producer of black in the nation. The state held sixteen plants in this year, with the greatest concentrations in Calhoun, Doddridge, Harrison, Lewis, and Ritchie counties. The state remained the nation's leading producer of carbon black until 1921, when it was surpassed by Louisiana, where cheap gas from the Monroe field had lured manufacturers west.

Imperial's Carbon Black Plant

On June 4, 1908--the day after Imperial's incorporation--the company's two local shareholders, J.L. Mann and Joseph Hartman, leased an eight-acre tract along the North Fork of the Hughes River at the Gooseneck from Zimri and Sara C. Flanagan, who had inherited one-fifth of the 550-acre Flanagan family farm. Two months later Imperial also signed a lease with the Flanagans to drill for oil and gas on a forty-two acre tract in the same area. Situated along Lorama Railroad, a narrow-gauge line that extended through Harrisville to the Baltimore and Ohio Railroad's main line at Cornwallis, and in the center of the Gooseneck oil and gas field, this tract was an ideal industrial site. The nearby community, Hannahdale, though quite modest in population, boasted a post office, store, and train stop.

Shortly after leasing the Flanagan property, Imperial began to build its carbon black factory. At the same time, the company leased tracts from local property owners, drilled wells, and laid pipelines. Eventually, Imperial owned leases on over 6,350 acres on the North Fork of Hughes River watershed, and had agreements to purchase gas from several smaller local companies, most of which sold Imperial gas from single wells. By 1912, if not sooner, the carbon plant was in production.

Imperial's carbon black plant utilized the channel process. With an annual production of from 150,000 pounds to 250,000 pounds of black, the plant was comparatively small. Neither a description nor a photograph of the Imperial plant is available, but by this time the channel process had become standardized, so it is likely that it resembled a typical plant of this period. A typical plant consisted of a gasometer tank and piping, condensing buildings, engine house, bolting and packaging houses, and warehouses.

The gasometer tank received gas coming from the wells, stored it under pressure, then delivered

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it to the gas burners through piping. It consisted of two tanks made of boiler plate, one inverted in the other, with the upright tank partially filled with water. The gas passed into the inverted tank where it was held by a water seal. The weight of the tank, and, if necessary, additional steel weights, held down the pressurized inverted tank. The gas was released at the low discharge pressure of 1 ounce, this pressure being maintained by a butterfly valve in the gas line which activated a lever arm positioned on the inverted tank. The gas was delivered to the condensing buildings through 8" gas lines.

The condensing buildings contained the essential machinery of the operation: the channels, hoppers, scrapers, and burners. Like all of the buildings, there were of fireproof construction, made of sheet iron held by wire to a steel frame made of angle iron. The buildings were usually from 18' to 20' wide and 80' to 115' long with slits or sliding doors along the bottom to control the air supply. They were arranged in parallel rows separated by an alleyway about 15' wide. The number of condensing buildings determined the capacity of the plant: a small plant consisted of from 6 to 12, while one of the largest of this era held 180 condensing houses. It is unlikely that Imperial's plant held more than twelve condensing buildings.

The channels upon which the black was deposited were made of mild steel, 7" to 8" wide. They hung from trucks that ran on overhead rails attached to the frame of the building, and were moved in a back and forth motion by truck wheels. Below the channels were the scrapers which removed the carbon. They were made of sheet steel about 1" wide and 8" long, and actuated by a system of levers moved by an automatic trip, termed by the workmen a "grasshopper." Steel hoppers, spaced about 4' apart, rested below the scrapers and channels for collecting the black. Between the hoppers were the burners, positioned 3" to 4" below the channels. Each burner held eight to ten lava tips, where the gas was burned. The lava tips were made of steatite, heat-treated for strength. The large number of patents issued for burners and tips during this period suggests that more variation occurred in this facet of the operation than any other. Delivered through 1" piping, the gas burned with a uniform, luminous, and smoky flame, depositing the black on the underside of the channels.

After the black was scraped, it fell into the hoppers, where it was carried away by screw conveyors, which were 7" or 8" in diameter, made of sheet iron, and often fabricated at the plant. The conveyors moved the product to a separate, but sometimes attached, building where the black was bolted and packed. The bolting machines removed the grit, scale and oversize particles in the black. They were essentially steel screens of 45 to 60 mesh housed in metal cabinets.

The machinery was driven usually by a natural gas engine, typically a two-cycle type of about 20 horsepower. The engine was connected to a shaft which drove the conveyors, elevators, bolting machines, and actuated the channels. The engine was enclosed in a fire-proof steel frame building.

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After bolting, the black was conveyed to storage bins in the same building, where it was held for packaging. It appears that Imperial packed the black in fifteen-pound paper bags, the conventional size in the industry. The packers, which moved the black from bins into paper bags with an augur-type conveyor, were similar to those used at sugar refineries. From here the black was stored in a storage building until it was ready to be shipped on the narrow-gauge Lorama Railway to Pennsboro, where the company had a warehouse. From here, it was transferred to B&O Railroad cars and shipped to markets..

Gas Compression Station/Natural Gasoline Plant

In addition to its carbon black operation, Imperial produced and sold natural gas and gasoline. As the carbon black plant was nearing completion, Imperial began building a compression station nearby. The compression station was necessary because the "rock" or natural pressure of the gas was insufficient to propel it through pipelines. An additional benefit of the station was that it permitted the extraction of natural gasoline from the gas through compression and cooling.

While the first compression station in the nation had been completed in 1894, and the process had become standardized by 1910, the manufacture of natural gasoline was a later development. Natural gasoline is a liquid mixture of hydrocarbons extracted from natural gas. The term "natural" gasoline is used to distinguish it from gasoline produced from crude oil by distillation and cracking in refineries. Only so-called "wet gas," which is found in strata which also hold petroleum and which contains a high proportion of the lower hydrocarbons (ethane, propane, etc.) can be used to recover natural gasoline. "Dry gas," found in strata that holds no oil, contains as much as ninety-five percent methane, the higher hydrocarbon, and can not be liquified.

Natural gasoline also should be distinguished from "casing-head" or "drip" gasoline. The terms are often used synonymously, and although the products are nearly identical in chemical and physical composition, they are the results of different processes. Casing-head or drip gasoline is a byproduct of oil and gas production, the natural condensation of petroleum vapors that accumulate in well casings and pipelines. Encountered by the earliest drillers, particularly in the Appalachian fields where "wet" gas predominates, this type of gasoline was considered a nuisance until the turn of the twentieth century, when the development of the automobile provided a market. Manufactured natural gasoline is an intended byproduct of natural gas compression or other special processing.

In the early days of this industry, natural gasoline was extracted from gas in compression plants by compression and cooling. While each oil and gas region had its pioneers, the Sutton Brothers and Edmonds Company of Sistersville, West Virginia was probably the first to produce natural gasoline with this method. This company established a factory near Sistersville in 1903 which compressed the rich gas found there and cooled it through lines laid in the Ohio River. Spurred

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by the growing demand for automotive fuel, the industry grew at a brisk pace; by 1912 there were 250 plants in the United States, all of the compressor type. With its cheap natural gas, West Virginia led the nation in the production from 1911 to 1913, but fell behind Oklahoma in 1914; the state maintained second or third place in this field until the late-1920s.

A typical compression station/natural gasoline plant of this era consisted of a prime mover, two-stage compressors, condensing and cooling tanks, facilities for pumping water, and an accumulator. While the early compression stations used steam to power compressors, by 1910 the natural-gas engine, which was first used to pump wells during the early-1890s, had become commonplace in the West Virginia oil and gas fields. Since it dispensed with the boiler house and utilized readily-available fuel, the natural-gas engine was much cheaper to operate, a factor which outweighed its drawbacks--difficulty in starting and a tendency to explode. The engines were sometimes belted to the compressors, but just as often directly connected. The compressors took the gas at rock pressure, and, in two stages, compressed it up to 200 pounds per square inch. The Ingersol-Rand Company or the Bessemer Company were the chief suppliers of compressors during this period. Bessemer also manufactured gas engines, and, after 1910 supplied customers with complete natural gasoline plants.

The compressed gas, at high temperature, left the compressor and was piped to cooling coils, which were emersed in water tanks, where condensation took place. Since water was also required to cool the compressors, water pumps and holding tanks were a necessary part of every facility. From the cooling coils, the condensate was collected in a large accumulator, where the gasoline was separated from water and other impurities. Meanwhile, the residuary natural gas was transferred to a main transmission line and delivered to both the carbon black factory and to customers.

Imperial's natural gas went both to larger regional companies with widespread distribution systems, including Standard Oil's Hope Gas Company, the Carnegie Gas Company, and the Pittsburgh & West Virginia Gas Company, and to municipal and residential customers, including the Ritchie County towns of Harrisville, Ellenboro, and Lamberton. It had a unique customer in Harrisville, which for some twenty years prior to selling its franchise to Imperial owned its own profitable gas well and distribution works. For many years, the municipality leased its pipelines and equipment to various companies which not only supplied the town but also paid a fee which offset local taxes. By 1907 Harrisville was a taxless town, an enviable status it held until the late-1910s. However, by 1917 gas supplies were dwindling and the price of gas was sharply rising, so the town was forced to sale its municipal gas distribution system. After a referendum on the issue, the system was sold to Imperial in October, 1918 for five thousand dollars along with a ten-year franchise to distribute natural gas throughout the town.

By 1918 Imperial had a substantial industrial complex on its leased land near Hannahdale. This complex included the compression station and natural gasoline plant, carbon black plant and warehouses, water tanks on the hillside above, and an office building. The company also leased

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a building in Pennsboro at the corner of Davis and Clayton streets adjacent to the Lorama Railroad. This building was used as a warehouse, where its stocks of carbon black and natural gasoline were stored after being shipped on the Lorama Railway from Hannahdale, for shipping on the Baltimore and Ohio Railroad.

Despite such a large investment in facilities, Imperial remained in operation at Hannahdale only until 1929. In May, 1929 the company assigned all its facilities except for the carbon black plant, along with its oil and gas leases, to Reno Oil Company, which had its office at Sistersville. Except for the buildings, Imperial moved its carbon black plant to Monroe, Louisiana, where cheap natural gas was available. Many of Imperial's employees migrated west with the company. The company continued to produce carbon black there and in a plant at Sterlington, Louisiana through the 1940s. On June 30, 1952 Imperial Oil and Gas Products Company was dissolved.

Reno Oil Company continued to operate the compressor station and natural gas plant until the 1940s. Clyde Post, a resident of Harrisville, recalled visiting the plant during this period to obtain gasoline at fifty cents for five gallons. The buildings which housed the plants stood unused until the 1950s, when lack of maintenance and the 1950 flood took their toll, and they collapsed. Field investigations revealed that the land where the carbon black factory stood has been recently bulldozed.

Site Interpretation

Field visits, archival photographs, including a ca. 1920 photograph entitled "Imperial Oil and Gas - Hannahdale, W. Va.," and informant interviews indicate that nearly all features, with the possible exception of the piers representing structures at the extreme southwest of the site, represent the remains of an early twentieth-century compression-condensation natural gasoline plant and natural gas compression station. This is supported by the individual leases of property from Zimri Flanagan to Imperial for a carbon black factory and a gasoline plant; local informant Clyde Post's recollection that the carbon black factory was located about 200' upstream from the pumping station; and the fact that safety would dictate the wide separation of the two processes--one which employed open flame and one which processed extremely volatile and flammable fuels.

Nearly all surface features are site-cast concrete foundations, slabs, pads, and piers. The largest feature is the main floor of the compression station, comprising F1 through F7 and F48, a large concrete slab with raised pads. There are seven pads that supported large single cylinder, 80 horsepower, combined engine/two-stage compressors, separated by two pads (F48) that supported two duplex (twin-cylinder) engines of 160 to 200 horsepower, also with integral two-stage compressors.

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Next to Feature F7 are four six-inch casing segments sunk in the concrete slab in a rectangular pattern. In similar installations with large engines, a large compressed air tank was installed on a platform resting on similar piers; it was used to store air to kick over the engines during start-up.

Features F10, F11, F12, and F47 are structures that housed the exhaust stacks from each engine. These are visible in the ca. 1920 photograph. Their function was to quiet the ringing of the exhaust pipe, which could crack quite loudly without some sort of muffling. Noise was directed vertically.

Features F17, F18, F19, F21, F22, and F23 are trough-like concrete structures that functioned as cooling tanks for the water-cooled engines. Many such engines used open wooden or steel barrels, but the extra surface area these troughs provided would have been more efficient for cooling the water. Early engines operated on a thermal siphoning system, although water could be pumped through them with an external pump as well. Note that the function of these troughs differs from features F24 and F25.

Feature F14A-F is a complex slab with several pads as components. In the ca. 1920 photograph this is the end-gable structure next to the compression station, to the right of a similar structure. These pads are much smaller than the pads in the compression station. This structure probably housed water pumps belted to small gas engines for pumping well water and/or moving water around the site; it may also have been for the gasoline manufacturing process.

Feature F16 supported a horizontal tank and is represented by the structure closest to the camera in the ca. 1920 photograph. This is almost certainly the accumulator/separator apparatus for the gasoline manufacturing process.

The two troughs represented in Features F24 and F25 were covered by open shed-like structures which can be seen at the far right of the ca. 1920 photograph. These were the cooling troughs for the coils in the gasoline manufacturing process. A long, tightly wound coil of two-inch tubing was suspended in these pits to condense the gasoline, water, and other volatile compounds from the compressed raw natural gas. The condensate was then conducted to the accumulator/separator apparatus. Features F43 and F26 cannot be positively identified, but viewing the ca. 1920 photograph shows a tall pipe-like structure with spiral stairs to the top, and the top of a 300-barrel tank in the places where these features are found. Speculatively, the tank was a water reservoir for the cooling troughs, and the tower at F43 was a part of the separation process where the gasoline was isolated from the other condensates and water.

The foundations at F28/F29/F30/F49/F50 are from a structure that was situated parallel to the compression station. This may have been a workshop/toolhouse/machine shop to support the compression station. No other foundations in this group would have been of the size necessary for such a support structure.

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The structures that rested on the piers represented as F31 through F36 were probably not process buildings, as the piers and extant remains suggest wooden, not concrete floors and thus no heavy machinery. Product and supply storage, probably carbon black and gasoline, was their most likely function. Several shallow pits and trenches were identified at F33 and F36, suggesting that gas or water was plumbed into these structures. Examination of the vegetation in the area suggests that the area southwest of the F37 road has been thoroughly bulldozed. This is the most likely location of the former carbon black plant.

SOURCES OF INFORMATION

A. ENGINEERING DRAWINGS

No engineering drawings of the plant are known to exist.

B. HISTORIC VIEWS

"Imperial Oil and Gas - Hannahdale, W. Va.," Undated Photograph (ca. 1920), from collection of the Oil and Gas Museum, Parkersburg, W. Va.

C. INTERVIEWS

Workman, Michael E., "Interview of Clyde Post," conducted at Harrisville, W. Va. on July 31, 1999. Post is a long-time resident of the Harrisville area; he has visited the natural gasoline plant and natural gas compression station several time since the 1940s.

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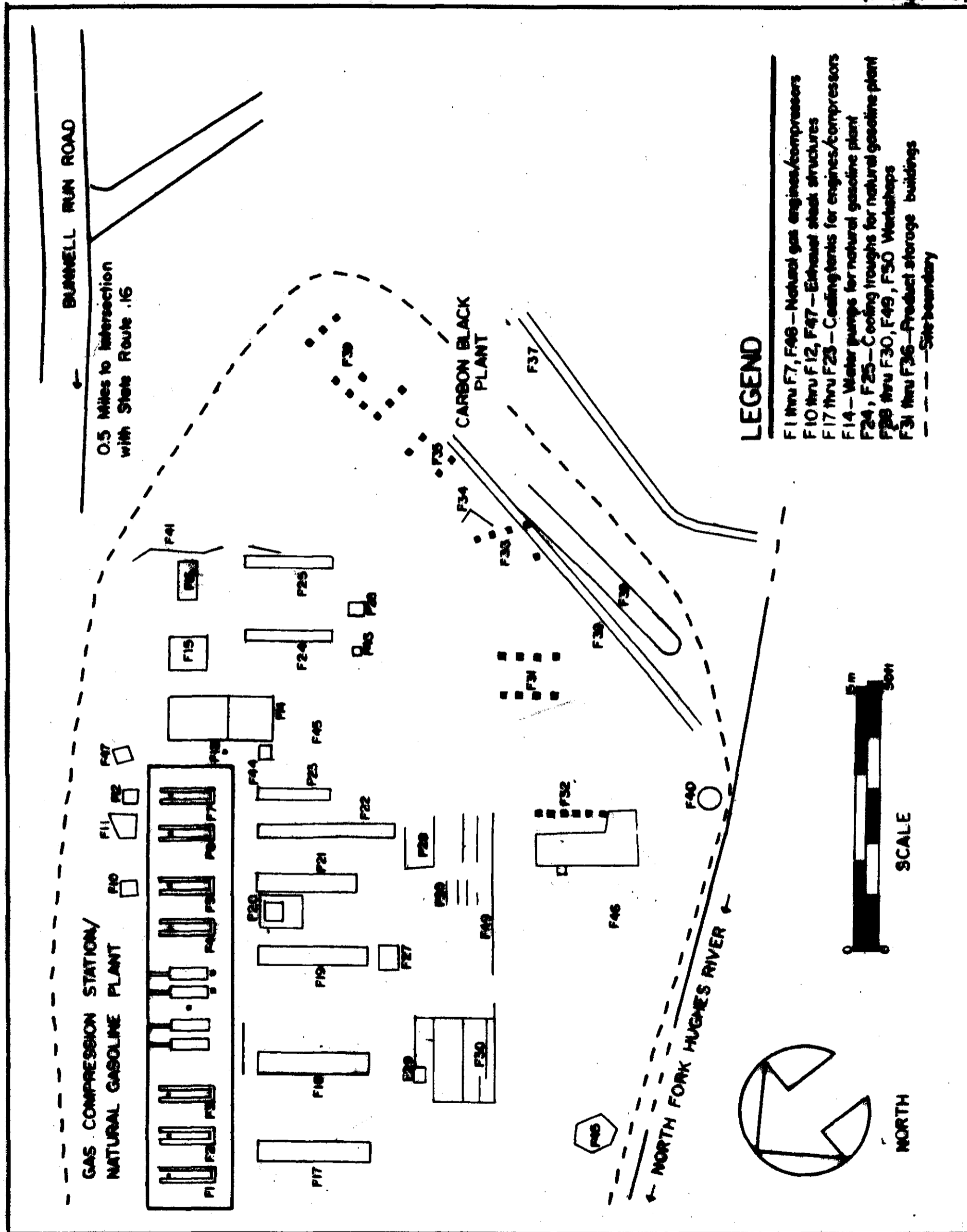
E. LIKELY SOURCES NOT YET INVESTIGATED

Reseachers were unable to locate records of the Imperial Oil and Gas Products Company, which built the plant and was dissolved on June 30, 1952, or the Reno Oil Company, which operated the natural gasoline plant and natural gas compression station. If such records could be found, they probably would add greatly to our knowledge of the site.

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LEGEND

- F1 thru F7, F46 - Natural gas engines/compressors
- F10 thru F12, F47 - Exhaust stack structures
- F17 thru F23 - Ceilings/berms for engines/compressors
- F14 - Water pumps for natural gasoline plant
- F24, F25 - Ceilings/berms for natural gasoline plant
- F28 thru F30, F49, F50 - Workshops
- F31 thru F36 - Product storage buildings
- Site boundary

